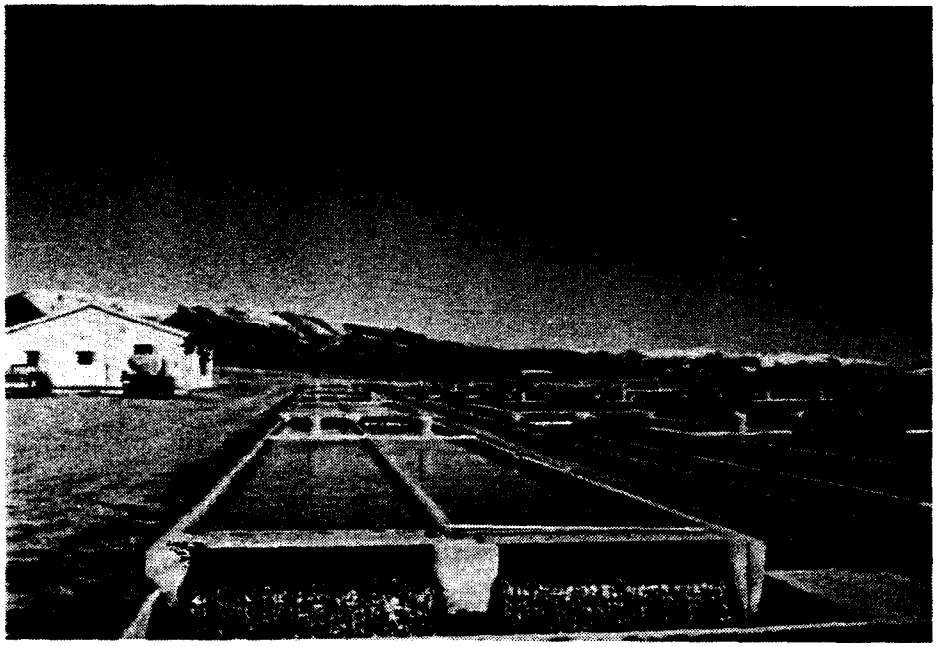
MACKAY HATCHERY
ANNUAL REPORT

October 1, 1984 to September 30, 1985



by
William C. Doerr
Fish Hatchery Superintendent II

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ABSTRACT

Mackay Hatchery is currently assigned a specialty status with emphasis on resident catchable, fingerling and fry production for statewide distribution.

Production during October 1, 1984 to September 30, 1985 included:

1. 110,000 (31,000 lb) R1 rainbow trout catchables,

2. 198,000 (1,540 lb) McConaughy strain rainbow trout fingerlings,

3. 247,000 (3,384 lb) Mt. Lassen strain rainbow trout fingerlings and fry,

4. 180,000 (2,725 lb) Mt. Shasta strain rainbow trout fingerlings,

5. 1,500,000 (10,720 lb) Henrys Lake strain cutthroat trout fry and fingerlings,

6. 235,000 (3,688 lb) Crawford strain brown trout fingerlings,

7. 401,000 (3,875 lb) Plymouth Rock strain brown trout fingerlings,

8. 184,000 (3,889 lb) fall chinook salmon fingerlings,

9. 797,000 (17,760 lb) coho salmon fingerlings, and

10. 1,500,000 (1,251 lb) late kokanee fry.

At the beginning of the fish year, 110,620 rainbow trout weighing 300 pounds net were on hand. (Net = pounds produced minus pounds received.) Total Mackay Hatchery fish planted or transferred numbered 5,336,186 and weighed 79,434 lb. A total of 119,740 Mt. Lassen rainbow trout weighing 3,726 lb (net) were on hand at the end of the fish year, bringing total fish production to 5,345,306 fish weighing 82,860 lb.

A total of 99,064 lb of fish feed was utilized at a cost of $21,164.61. A feed conversion of 1.20 was attained; the feed cost per pound of fish produced was $0.2554. When all hatchery costs were included, each pound of fish produced required an expenditure of $2.43. This cost includes the costs of redistributing catchables and of planting high mountain lakes with fry received from other hatcheries. The numbers of fish redistributed are not included in our production figures.

Mackay Hatchery is also used as a catchable rainbow trout redistribution facility. A total of 62,117 rainbow trout (weighing 19,100 lb) received from Hagerman State Fish Hatchery (SFH) and American Falls SFH were redistributed to the Lost River Sinks and upper Salmon River tributaries.

There were 114 high mountain lakes in Regions 3, 4 and 6 planted with rainbow and cutthroat trout fry transferred here from McCall SFH.

Author:

William C. Doerr
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INTRODUCTION

Mackay Hatchery is located 12 miles northwest of the town of Mackay, Custer County, Idaho, situated in a high desert plateau at an elevation of nearly 6,300 feet. The hatchery is a somewhat unique "closed system". Water rises from springs on the hatchery grounds and after leaving the hatchery, it gradually sinks back into the ground to become part of the Lost River Sinks.

Since the earthquake in 1983, water rises in three springs with water temperatures of 52°F, 54°F and 56°F. Water flows fluctuate seasonally from 16 cfs to 22 cfs. Spring water containing 1 to 3 parts per million (ppm) of oxygen is routed through packed-column aerators to bring oxygen levels up to 7+ ppm.

The physical plant consists of a hatchery building containing 13 Heath incubator stacks providing 195 incubation trays, along with 30 fiberglass nursery troughs each 14.5 ft x 21 in x 9.5 in deep. The building is supplied with 52°F water via **a** 12-inch pipeline, with a 24-inch packed-column aerator on the intake.

Eight fry raceways, each 3 ft x 100 ft x 2 ft deep, are supplied with 54°F water via a 14 inch pipeline with a 12-ft packed-column aerator on the intake of each raceway.

Eight production raceways, each 8 ft x 400 ft x 3 ft deep are supplied with water via a 30-inch pipeline and a covered headrace. The production raceways can be operated with either of two different water supplies, or a mixture of the-two. Five cfs of 56°F water runs through six 48-inch packed-column aerators and arrives at the raceways at 7.6 ppm of oxygen. Ten cfs of water at 52°F arrives at 5.6 ppm of oxygen.

A 10 ft x 44 ft x 3 ft deep quarantine raceway is used to hold fish transferred here from other hatcheries prior to distribution. Water to the quarantine raceway is supplied from the tailrace of the large raceways.

OBJECTIVES

Because of its specialty status, the objectives of Mackay Hatchery change from year to year, depending on management needs and specialty species egg availabilty. The 1984 to 1985 objectives were as follows:

1. To rear a variety of species and strains of fry and fingerlings for distribution to various locations in all six regions of the state. These include: (1) 600,000 rainbow trout of various strains, (2) 1,500,000 cutthroat trout, (3) 600,000 brown trout, (4) 200,000 fall chinook salmon, (5) 800,000 coho salmon, and (6) 1,500,000 late kokanee salmon.

2. To rear appropriate numbers of three different strains of rainbow trout for rainbow trout strain evaluation studies in Anderson Ranch, Horsethief and Ashton reservoirs.

3. To raise 110,000 disease-free rainbow trout catchables for Regions 2 and 6.

4. To stock designated high mountain lakes in Regions 3, 4 and 6.

5. To receive and redistribute 20,000 lb of catchable rainbow trout to the upper Salmon River drainage and the Lost River Sinks drainages.

Fish Production

Six species and 11 strains of fish were raised at Mackay Hatchery this year, with percent survivals (live fish at release divided by eggs received) ranging from 42% to 86.3% (Table 1).

We planted or transferred 5,336,186 fish weighing 79,434 pounds to waters and hatcheries in all 6 regions of Idaho (Table 2). An additional 119,740 fish weighing 3,726 pounds (net) were on hand at the end of the fish year. We started the year with 110,620 fish weighing 300 pounds (net), which brings net production to 82,860 pounds.

Eggs and fry for our programs are received from various locations in the United States (Table 3).

Fish Health

Fish health was generally good this year due to improvement of water quality created by the new packed-column aerators installed in the construction of 1984.

Lot 4-U-Id-FC-17 (Wolf Lodge fall chinook) suffered a 50% loss to coagulated yolk prior to swim-up. We did not see a similar condition in the Great Lakes fall chinook, and we assume it may be related to the 1984 petroleum spill in Wolf Lodge Creek.

Lot 4-U-Nb (Crawford brown trout) suffered from environmental gill disease after being put in large raceways where they were subjected to a mixture of 33% aerated water. A similar situation occurred after the earthquake of 1983 with brown trout in raw water. In the 1985 to 1986 season, we left the browns in small raceways where they enjoyed 100% aerated water until planting.

Lot 5-U-Id-C3 (Henrys Lake cutthroat) suffered from bacterial gill disease and enteric bacterial infection, suffering a 12 (1,500/1,500,000) loss. They were treated with a three-day flush of benzalkonium chloride and 14 days of TM-50D.

Table 1. Fish production at Mackay Hatchery, October 1, 1984 to September 30, 1985.

Species	Lot number	Eggs received	%hatch	Fri received	Fish produced	% survival to planting	Pounds produced
Rainbow trout	4-U-Id-R1-16	0	-	120,500[a]	89,975	88.6	24,569
	4-U-Id-R1-07	0	-		19,658	95.9	8,101
	5-Y-Ca-R4	329,854	95	0	233,030	70.6	3,315
	5-U-ld-R4-06	0	-	105,300	103,840	98.6	3,689
	Net[b]						
	5-U-Id-R4-16	0	-	36,960	30,195	81.7	76
	Net						
	5-En-R5	391,000	97	0	180,035	46[c]	2,725
	5-En-Mc	360,944	92	0	197,860	54.8	1,540
Brown trout	4-U-Nb	272,320	97.3	0	235,055	86.3	3,875
	5-Y-Ma	508,024	97	0	401,050	78.9	3,875
Cutthroat trout	5-U-Id-C3	2,078,00	82	0	1,488,353	71.6	10,720.5
Fall chinook salmon	4-U-In-FC-2	300,328	67.6	0	174,956	58.3	3,639
	4-U-Id-FC-17	22,625	88.4	0	9,500	42[c]	250
Coho salmon	4-Qc	1,102,391	98	0	796,790	72.3	17,760
Late kokanee salmon	5-U-Id-KL	1,794,77	88	0	1,495,631	83.3	1,251

[a]On hand October 1, 1984.
[b]Net = pounds produced minus pounds received.
[c]See "Fish Health."

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Table 2. Fry, fingerling and catchable plants and transfers from Mackay Hatchery production fish, October 1, 1984 to September 30, 1985.

Species	Strain	Receiving waters	Number	Pounds	Region
Fall Chinook	Wolf Lodge	Mormon Reservoir	9,500	250	4
	Great Lakes	Mormon Reservoir	596	12	4
		Lost Valley Reservoir	5,040	112	3
		Oakley Reservoir	15,075	335	4
		Deadwood Reservoir	10,120	220	3
		Salmon Falls Reservoir	100,860	2,110	4
		Chesterfield Reservoir	22,905	450	5
		Hale Hatchery (Mullan)	20,360	400	1
Coho salmon	Quilcene	Ririe Reservoir	72,360	1,160	6
		Cascade Reservoir	384,580	9,100	3
		Island Park Reservoir	331,050	7,300	6
		Sublett Reservoir	8,800	200	4
Late kokanee salmon	Pend Oreille	Lucky Peak Reservoir	661,940	655	3
		Island Park Reservoir	833,689	596	6
Rainbow trout	Unspecified	Dworshak Reservoir	80,085	21,075	2
		Local plants	29,548	11,595	6
	Mt. Lassen	Mackay Reservoir	82,950	1,185	6
		Horsethief Reservoir	15,180	230	3
		Anderson Ranch Reservoir	134,900	1,900	4
	McConaughy	Horsethief Reservoir	14,900	100	3
		Anderson Ranch Reservoir	135,000	900	4
		Mackay Reservoir	47,960	540	6

Table 2. Continued.

Species	Strain	Receiving waters	Numbers	Pounds	Region
Rainbow trout	Mt. Shasta	Ashton Reservoir	20,378	285	6
		Horsethief Reservoir	15,040	235	3
		Anderson Ranch Reservoir	135,030	2,100	4
		Iron Lake	5,022	55	6
		Mackay Reservoir	4,645	50	6
Cutthroat trout	Henrys Lake	Henrys Lake	839,730	6,450	6
		Island Park Reservoir	100,200	600	6
		Teton River	484,579	3,386	6
		High mountain lakes	42,845	64.5	3,4,6
		Ashton Reservoir	20,999	220	6
Brown trout	Plymouth Rock	Willow Creek	24,000	250	6
		Clark Fork Hatchery	247,450	2,225	1
		Hagerman Hatchery	129,600	1,400	4
	Crawford	Little Wood River	99,499	1,000	4
		Billingsly Creek	20,246	265	4
		Mormon Reservoir	100,310	2,090	4
		Palouse River	15,000	333	2

Table 3. Origin of fish species reared at Mackay Hatchery, October 1, 1984 to September 30, 1985.

Species	Strain	Lot number	Received from	Received as
Rainbow trout	Unspecified	4-U-Id-R1-16	McCall SFH, Idaho	Fry
		4-U-Id-R1-07	Ashton SFH, Idaho	Fingerlings
	Mt. Lassen	5-Y-Ca-R4	Mt. Lassen Trout Farms, CA	Eggs
		5-U-Id-R4-06	American Falls SFH, Idaho	Fingerlings
		5-U-Id-R4-16	McCall SFH, Idaho	Fry
	Mt. Shasta	5-En-R5	Ennis NFH, Montana	Eggs
	McConaughy	5-En-Mc	Ennis NFH, Montana	Eggs
Brown trout	Crawford	4-U-Nb	Crawford SFH, Nebraska	Eggs
	Plymouth Rock	5-Y-Ma	Plymouth Rock Trout Co., MA	Eggs
Cutthroat trout	Henrys Lake	5-U-Id-C3	Henrys Lake SFH, Idaho	Eggs
Fall chinook salmon	Great Lakes	4-U-In-FC-2	Twin Branch and Mixawba SFH, IN	Eggs
	Wolf Lodge	4-U-Id-FC-17	Hale SFH, Mullan, Idaho	Eggs
Late kokanee	Pend Oreille	5-U-Id-KL	Hale SFH, Mullan, Idaho	Eggs
Coho	Quilcene	4-Qc	Quilcene NFH, Washington	Eggs

In July of 1985, Lot 5-En-R5 (Mt. Shasta rainbow), which we were keeping for holdovers, suffered an infection that was presumptively diagnosed by Dr. G.W. Klontz to be IHNV. The entire lot of 52,700 fish was destroyed. Samples were sent to the International Aquaculture Research Center. However, no virus was isolated. After this incident, all large raceways, headrace, tailrace and the quarantine pond were scraped clean, air-dried and sprayed with 12.5% sodium hypochlorite.

FISH RELEASES

Fry and Fingerling Transfers and Plants

A total of 5,191,978 fry and fingerlings weighing 48,763 lb were transferred to other stations or planted in waters of all six regions of the state (Table 2).

Catchable Plants

A total of 109,633 catchable rainbow (weighing 32,670 lb) were planted in Dworshak Reservoir and in various waters of Region 6.

High Mountain Lake Program

There *were* 114 high mountain lakes in Regions 3, 4 and 6 planted with rainbow and cutthroat trout fry this year by Forest Service contract helicopter. Rainbow trout for the flights were obtained from the McCall SFH. None of these fish .have been included in our production figures, although the costs of planting were absorbed by the Mackay budget.

Catchable Rainbow Trout Redistribution

Mackay Hatchery is used for redistribution of catchable rainbow trout trucked here from Hagerman and American Falls hatcheries. During 1984 to 1985, 62,117 fish weighing 19,100 pounds were redistributed.

The planting area included the Lost River Sinks (Birch Creek, the Little Lost River drainage and the Big Lost River drainage) and upper Salmon River tributaries from Indianola to Yankee Fork.

FISH FEED UTILIZED

A total of 99,064 pounds of fish feed was utilized at a cost of $21,164.61. A feed conversion of 1.20 was attained, and feed cost per pound of fish produced was $0.2554. The three brands of feed used during the year were Rangen dry (80,497 pounds), Rangen semi-moist (300 pounds) and Clear Springs dry (18,267 pounds).

HATCHERY VISITORS

Because of its remote location and severe climate, Mackay Hatchery attracts few visitors other than fishermen, hunters and sight-seers who happen here incidental to other activities. The total number of visitors in the last year was approximately 750.

HATCHERY IMPROVEMENTS

The exteriors of all hatchery buildings were painted. Earth tones were chosen to reduce the facility's visual impact against the sage desert background.

The repair of cracked and spalled areas on the raceway walls is a continuing process and must be done each summer to keep pace with deterioration. New carpets and linoleum were installed in Residence 3, basement walls in Residence 1 were insulated and finished and a snowblower was obtained from the American Falls Hatchery to help keep hatchery drives open in the winter months.

MISCELLANEOUS ACTIVITIES

Mackay Hatchery has been chosen to be the producer of fish for the strain evaluations ongoing in various reservoirs in the southern part of the state. Three rainbow trout strains were marked in various ways and released in Anderson Ranch, Ashton and Horsethief reservoirs (Table 4).

HATCHERY NEEDS

Four additional raceways, each 5 ft x 80 ft x 3 ft deep, with packed-column aerators should be built to take advantage of water now being wasted. This will free up more space in the 8 ft raceways for catchable production so that we will no longer need to put our production at risk by importing catchables from other hatcheries. It will also free up more space in the small raceways, which are now needed entirely for brown trout production (see Fish Health).

Table 4. Fish marked at Mackay Hatchery, October 1, 1984 to September 30, 1985. Numbers in parentheses indicate those fish already fluorescent-grit marked as part of the larger group for a particular reservoir.

Lot number	Strain & species	Number marked	Marking method	Planting site
5-En-R5	Mt. Shasta rainbow	20,378	Adipose clip	Ashton Reservoir
		135,030	Red fluorescent grit	Anderson Ranch Reservoir
		(30,470)	Coded wire tag	Anderson Ranch Reservoir
		15,040	Red fluorescent grit	Horsethief Reservoir
5-Y-Ca	Mt. Lassen rainbow	134,900	Yellow fluorescent grit	Anderson Ranch Reservoir
		(28,496)	Coded wire tag	Anderson Ranch Reservoir
		15,180	Yellow fluorescent grit	Horsethief Reservoir
5-En-Mc	McConaughy rainbow	135,000	Lt. green fluorescent grit	Anderson Ranch Reservoir
		(29,346)	Coded wire tag	Anderson Ranch Reservoir
		14,900	Lt. green fluorescent grit	Horsethief Reservoir
5-U-ld-C3	Henrys Lake cutthroat	79,688	Adipose clip	Henrys Lake
		20,999	Adipose clip	Ashton Reservoir

A low-water alarm needs to be installed at the intake to the hatchery building. All other intakes are relatively foolproof.

The 30 inch pipeline to the large raceways (installed in 1951) needs to be replaced prior to rust out.

The fish culturist position, which was removed temporarily during the realignment of June 1983, needs to be reinstated in order to coincide with the production capability of the new water system.

ACKNOWLEDGEMENTS

Hatchery staffing during the 1984 to 1985 fish year included: Bill Doerr, Fish Hatchery Superintendent II; Doug Anderson and Doug Burton, Fish Hatchery Superintendents I (stationed here at different times); Lola Coates, Laborer; and Scott Patterson, Bio-Aide.

Submitted by:

William C. Doerr
Fish Hatchery Superintendent II

Approved by:

IDAHO DEPARTMENT OF FISH & GAME

Jerry M. Conley, Director

David L. Hanson, Chief
Bureau of Fisheries

Mike Larkin
Resident Hatchery Supervisor